STERILIZATION AND OPERATIVE ROOM SETTING

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PLASTIC AND RECONSTRUCTIVE SURGEON



- Infection is a major risk of surgery and infections related to improper equipment reprocessing still occur, despite modern technologies and procedures.
- Achieving effective disinfection and sterilization is essential for ensuring that medical and surgical equipment/devices do not transmit infectious pathogens to patients/residents or staff.



- Medical equipment/devices that have contact with sterile body tissues or fluids are considered critical items
- All critical medical equipment/devices must be sterilized, because microbial contamination could result in disease transmission.
- Critical items include surgical instruments, implants, foot care equipment, endoscopes that enter sterile cavities and spaces, eye equipment and dental equipment
- Semicritical medical equipment/devices have contact with nonintact skin or mucous membranes but do not penetrate them. Whenever possible, semicritical medical equipment/devices should be sterilized. If not possible, should be high-level disinfection.



- An item is either sterile or non-sterile (relatively sterile)
- Not all items can be sterilized by same methods, Surgical instruments, devices & heat sensitive items are sterilized by the method recommended by the manufacturer
- Single used or STERILE DISPOSABLE ITEMS SHOULD NOT REPROCESSED



TEMINOLOGY

STERILIZATION:

• The destruction of all forms of microbial life including bacteria, viruses, spores and fungi.

AN ANTISEPTIC IS

• a substance which inhibits the growth and development of microorganisms that applied to living tissue and skin

DISINFECTANT:

• A product that is used to disinfection the surfaces or medical equipment/ devices It is applied to inanimate objects.



• CLEANING:

• The physical removal of foreign material (dust, soil) and organic material (blood, secretion) with water, detergents and mechanical action.

DECONTAMINATION:

• The process of cleaning, followed by inactivation of microorganism, in order to render the object safe for handling.

• DETERGENT:

• A synthetic cleansing agent that can emulsify oil and suspend soil



REPROCESSING

- The goals of safe reprocessing of medical equipment / device:
 - Preventing transmission of microorganisms to personnel and patients
 - Minimizing damage to medical equipment/ devices from foreign material or inappropriate handling.



REPROCESSING

- COLLECTION AT POINT-OF-USE, CONTAINMENT AND TRANSPORT
- DISASSEMBLY (IF REQUIRED)
- INSPECTION
- CLEANING
- RINSING (FOLLOWING DISINFECTION)
- DRYING/AERATION
- REASSEMBLY AND FUNCTIONAL TESTING
- DISINFECTION/STERILIZATION (INCLUDING ESTABLISHMENT OF THE LEVEL OF REPROCESSING REQUIRED FOR ITEMS, BASED ON THE RISK CLASS AND MANUFACTURER'S INSTRUCTIONS)
- CLEAN/DRY STORAGE
- CLEAN TRANSPORTATION



REPROCESSING

PRE-CLEANING

- Gross soil (e.g., faeces, sputum, blood) should be removed immediately at point-of-use.
- If cleaning cannot be done immediately, must be submerged in tepid water and detergent or enzymatic cleaner to prevent organic matter from drying on it.

TRANSPORTATION AND HANDLING

- Disposable sharps should be disposed of in an appropriate puncture-resistant sharps container at point-of- use, prior to transportation.
- Closed carts or covered containers to prevent the spill of liquids
- Soiled equipment/devices shall be transported by direct routes, avoiding clean/sterile storage and patient care areas, to areas where cleaning will be done
- Sterile and soiled equipment/devices shall not be transported together.



DISASSEMBLY

- Equipment/devices shall be disassembled prior to cleaning if there is one or more removable part
- facilitates access of the cleaning agent, disinfectant and/or sterilant to device surfaces

SORTING

- keeps medical equipment/devices that belong to a set together
- Sort equipment/devices into groups of like products requiring the same processes

SPAULDING CLASSIFICATION FOR MEDICAL DEVICES AND LEVELS OF DISINFECTION

- Three categories of medical devices and their associated level of disinfection
- · CRITICAL:

A device that enters normally sterile tissue or the vascular system or through which blood flows should be sterile.

SEMICRITICAL:

A device that comes into contact with intact mucous membranes and does not ordinarily penetrate sterile tissue. These devices should receive at least high-level disinfection

NONCRITICAL:

Devices that do not ordinarily touch the patient or touch only intact skin. These devices should be cleaned by low-level disinfection.



SOAKING

- PREVENTS SOIL FROM DRYING ON EQUIPMENT/DEVICES AND MAKES THEM EASIER TO CLEAN
- DO NOT USE SALINE AS A SOAKING SOLUTION AS IT DAMAGES SOME MEDICAL EQUIPMENT/DEVICES.
- USE DETERGENT-BASED PRODUCTS, INCLUDING THOSE CONTAINING ENZYMES, AS PART OF THE SOAKING PROCESS
- AVOID PROLONGED SOAKING (E.G., OVERNIGHT) OF EQUIPMENT/DEVICES



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CLEANING

- may be done manually or using mechanical cleaning
- Machines
 - washer-disinfector
 - ultrasonic washer
- Automated machines may increase productivity, improve cleaning effectiveness and decrease staff exposure to blood and body fluids
- manual cleaning may be required for delicate or intricate items.



MANUAL CLEANING

- Remove gross soil using tools such as brushes and cloths.
- then manually or mechanically flush with a detergent solution and rinse

MECHANICAL CLEANING

- accordance with the manufacturer's instructions
- ULTRASONIC WASHERS
 - recommended for any semi-critical or critical medical equipment/device that has joints, crevices, lumens or other areas that are difficult to clean





WASHER-DISINFECTORS

- STRONGLY RECOMMENDED FOR MEDICAL EQUIPMENT/DEVICES THAT CAN WITHSTAND MECHANICAL CLEANING
- WASHER-DISINFECTORS MAY BE USED FOR LOW-LEVEL DISINFECTION





• RINSING

 FOLLOWING CLEANING IS NECESSARY, AS RESIDUAL DETERGENT MAY NEUTRALIZE THE DISINFECTANT

DRYING

- IMPORTANT STEP THAT PREVENTS DILUTION OF CHEMICAL DISINFECTANTS WHICH MAY RENDER
 THEM INEFFECTIVE AND PREVENTS MICROBIAL GROWTH
- MAY BE AIR-DRIED OR DRIED BY HAND WITH A CLEAN, LINT-FREE TOWEL.



REASSEMBLY AND INSPECTION

- VISUALLY INSPECT ALL EQUIPMENT/DEVICES TO ENSURE CLEANLINESS AND INTEGRITY OF THE EQUIPMENT/DEVICE
- DO NOT REASSEMBLE EQUIPMENT/DEVICE PRIOR TO DISINFECTION/STERILIZATION UNLESS THE EQUIPMENT/DEVICE MANUFACTURER'S INSTRUCTIONS SPECIFY REASSEMBLY AT THIS STAG

LUBRICATION

- WRAPPING
 - MATERIALS USED FOR WRAPPING SHALL BE ALLOW ADEQUATE AIR REMOVAL, STEAM PENETRATION AND EVACUATION TO ALL SURFACES
 - EQUIPMENT/DEVICES THAT ARE TO BE STERILIZED REQUIRE WRAPPING PRIOR TO STERILIZATION (EXCEPT FOR IMMEDIATE USE STEAM STERILIZATION ('FLASH STERILIZATION')



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DISINFECTION

- DISINFECTION IS THE INACTIVATION OF DISEASE-PRODUCING MICROORGANISMS.
- DISINFECTION DOES NOT DESTROY BACTERIAL SPORES OR PRIONS.
- FALLS INTO TWO MAJOR CATEGORIES
 - LOW-LEVEL DISINFECTION
 - HIGH-LEVEL DISINFECTION.



- Cleaning
- Nature of objects: hinge ,tubes
- Concentration of disinfectant
- Time of contact



LOW-LEVEL DISINFECTION

- ELIMINATES VEGETATIVE (LIVE) BACTERIA, SOME FUNGI AND ENVELOPED VIRUSES.
- IS USED FOR NONCRITICAL MEDICAL EQUIPMENT/DEVICES AND SOME ENVIRONMENTAL SURFACES.
- LOW-LEVEL DISINFECTANTS INCLUDE
 - 3% HYDROGEN
 - 0.5% ENHANCED ACTION FORMULATION HYDROGEN PEROXIDE,
 - SOME QUATERNARY AMMONIUM COMPOUNDS (QUATS),
 - PHENOLICS
 - DILUTED SODIUM HYPOCHLORITE (E.G., BLEACH) SOLUTIONS



HIGH-LEVEL DISINFECTION

- ELIMINATES VEGETATIVE BACTERIA, ENVELOPED VIRUSES, FUNGI, MYCOBACTERIA (E.G., TUBERCULOSIS) AND NON-ENVELOPED VIRUSES.
- IS USED FOR SEMICRITICAL MEDICAL EQUIPMENT/DEVICES.
- THERE ARE TWO MAJOR METHODS OF DISINFECTION USED
 - LIQUID CHEMICALS
 - PASTEURIZATION.

METHODS OF DISINFECTION FOR SEMICRITICAL MEDICAL EQUIPMENT/DEVICES

- LIQUID CHEMICALS
 - A LIMITED NUMBER OF DISINFECTIONS CAN BE USED FOR THIS PURPOSE
 - 2% GLUTARALDEHYDE, FOR 20 MIN
 - 6% HYDROGEN PEROXIDE FOR 20-30 MIN
 - 0.2% PERACETIC ACIDFOR 5 MIN
 - 0.55% ORTHO-PHTHALALDEHYDE (OPA). FOR 5-12 MIN
 - THE OBJECT MUST BE THOROUGHLY RINSED WITH STERILE WATER



- PASTEURIZATION (THERMAL DISINFECTION)
 - IS A PROCESS OF HOT WATER DISINFECTION (MINIMUM 71°C /160 F FOR AT LEAST 30 MINUTES
 - SEMICRITICAL MEDICAL EQUIPMENT/DEVICES SUITABLE FOR PASTEURIZATION INCLUDE EQUIPMENT FOR RESPIRATORY THERAPY AND ANAESTHESIA.
 - ACCOMPLISHED THROUGH THE USE OF AUTOMATED PASTEURIZERS OR WASHER DISINFECTORS
 - ADVANTAGES
 - NO TOXICITY
 - RAPID DISINFECTION CYCLE
 - MODERATE COST OF MACHINERY AND UPKEEP



- DISADVANTAGES OF PASTEURIZATION INCLUDE:
 - MAY CAUSE SPLASH
 - PASTEURIZERS AND RELATED EQUIPMENT CAN BECOME CONTAMINATED WITHOUT A GOOD
 PREVENTIVE MAINTENANCE PROGRAM AND CAREFUL MONITORING OF PROCESSES



- STEAM UNDER PRESSURE (AUTOCLAVING)
- DRY HEAT(HOT AIR OVEN)
- CHEMICAL



- MOST COMMON AND MOST PREFERRED METHOD FOR HEAT STABLE ITEMS
- STEAM UNDER PRESSURE PERMITS PERMEATION OF MOIST HEAT TO POROUS SUBSTANCES BY CONDENSATION & RESULTS IN DESTRUCTION OF ALL MICROBIAL LIFE.
- THE STEAM MUST BE APPLIED FOR SPECIFIED TIME TO REACH A SPECIFIED TEMPERATURE.



- AN **AUTOCLAVE** IS A CLOSED CHAMBER IN WHICH ITEMS OR OBJECTS ARE SUBJECTED TO STEAM AT HIGH PRESSURE & TEMPERATURE ABOVE 100°C
- AUTOCLAVES COMMONLY USE STEAM HEATED TO 121–134 °C (250–273 °F). TO ACHIEVE STERILITY, A HOLDING TIME OF AT LEAST 15 MINUTES AT 121 °C (250 °F) AT 100 KPA, OR 3 MINUTES AT 134 °C (273 °F) AT 100 KPA IS REQUIRED.
- ADDITIONAL STERILIZING TIME IS USUALLY REQUIRED FOR LIQUIDS AND INSTRUMENTS PACKED IN LAYERS OF CLOTH, AS THEY MAY TAKE LONGER TO REACH THE REQUIRED TEMPERATURE



Table 25: Sterilization times 90

Type of instruments to be sterilized	Sterilization time
Gravity sterilizer:	
Unwrapped 121 °C (1.036 Bar)	20 min.
Unwrapped: 134 °C (2.026 Bar) (metal and glass only)	3 min.
Unwrapped: 134 °C (2.026 Bar) (e.g., rubber)	10 min.
Wrapped 121 °C (1.036 Bar)	30 min.
Wrapped 134 °C (2.026 Bar)	15 min.
High-speed vacuum sterilizer	
wrapped: 134 °C (2.026 Bar)	4 min.



PHASE I - LOADING PHASE - IN WHICH THE OBJECTS OR PACKS ARE LOADED IN THE STERILIZER.

• PHASE II - HEATING PHASE - IN WHICH THE STEAM IS BROUGHT TO PROPER TEMPERATURE & ALLOWED TO PENETRATE THROUGH THE OBJECTS IN THE CHAMBER.

• PHASE III - DESTROYING PHASE OR TIME TEMPERATURE CYCLE - IN WHICH ALL MICROBIAL LIFE IS EXPOSED TO THE KILLING EFFECT OF THE STEAM.



• PHASE IV - DRYING AND COOLING PHASE - IN WHICH THE OBJECTS ARE DRIED & COOLED THEN, FILTERED AIR IS INTRODUCED INTO THE CHAMBER, DOOR IS OPENED & PACKS ARE REMOVED STORED.

• PHASE V - TESTING PHASE - IN WHICH THE EFFICIENCY OF THE STERILIZATION PROCESS IS CHECKED. ALL MECHANICAL PARTS OF STERILIZERS, INCLUDING GAUGES, STEAM LINES & DRAINS SHOULD BE PERIODICALLY CHECKED BY A COMPETENT BIOMED ENGINEER.



ADVANTAGES:

- HIGHLY EFFECTIVE;
- RAPID HEATING AND RAPID PENETRATION OF INSTRUMENTS;
- NONTOXIC
- INEXPENSIVE
- CAN BE USED TO STERILIZE LIQUIDS.

• DISADVANTAGES:

- ITEMS MUST BE HEAT AND MOISTURE RESISTANT;
- WILL NOT STERILIZE POWDERS, OINTMENTS OR OILS.
- NEEDS GOOD MAINTENANCE.



METHODS OF STERILIZATION

• DRY HEAT STERILIZATION (HOT AIR OVEN):

- Dry heat is preferred for reusable glass, metal instruments, oil, ointments and powders.
- Do not use this method of sterilization for other items, which may melt or burn.
- not always appropriate, because it will damage heat-sensitive materials such as biological materials fiber optics,, electronics, and many plastics





- · Electrically heated with fan or a blower to ensure rapid and uniform heating
- the heat takes much longer to be transferred to the organism, both the time and the temperature must usually be increased
- Then the oven is allowed to cool gradually for about 2hrs before the door is opened

Table 26: Dry heat sterilization temperatures & times

Holding	Sterilization Time
Temperature	(After reaching the holding
	temperature)
180 °C	30 minutes
170°C	1 hour
160°C	2 hours
149°C	2.5 hours
141°C	3 hours



METHODS OF STERILIZATION

- FOR CRITICAL EQUIPMENT/DEVICES THAT CANNOT WITHSTAND HEAT STERILIZATION, CHEMICAL STERILIZATION IS REQUIRED.
- SOME EXAMPLES OF CHEMICAL STERILANTS INCLUDE:
 - HYDROGEN PEROXIDE GAS PLASMA
 - 100% ETHYLENE OXIDE
 - VAPOURIZED HYDROGEN PEROXIDE
 - OZONE
 - HYDROGEN PEROXIDE/OZONE COMBINATIONS \square
 - LIQUID PERACETIC ACID
 - 6% HYDROGEN PEROXIDE
 - 2% GLUTARALDEHYDE (> 10 HOURS)
 - 2% ENHANCED ACTION FORMULATION HYDROGEN PEROXIDE (6 HOURS)
 - 7% ENHANCED ACTION FORMULATION HYDROGEN PEROXIDE (20 MINUTES) \square



ETHYLENE OXIDE GAS

- Ethylene oxide can be used to sterilize most articles that can withstand temperatures of 50-60 °C.
- Used under carefully controlled conditions because it is extremely toxic and explosive
- Used for heat-labile equipment, fluids, and rubber, etc.
- Long period of aeration is required before the equipment can be distributed
- The operating cycle ranges from 2-24 hours and it is a relatively expensive process



HYDROGEN PEROXIDE GAS PLASMA

- GAS PLASMAS ARE GENERATED IN AN ENCLOSED CHAMBER UNDER DEEP VACUUM USING RADIO
 FREQUENCY OR MICROWAVE ENERGY TO EXCITE THE GAS MOLECULES AND PRODUCE CHARGED
 PARTICLES, MANY OF WHICH ARE IN THE FORM OF FREE RADICALS
- THE PROPOSED MECHANISM OF ACTION OF THIS DEVICE IS THE PRODUCTION OF FREE RADICALS
 WITHIN A PLASMA FIELD THAT ARE CAPABLE OF INTERACTING WITH ESSENTIAL CELL COMPONENTS
 (E.G., ENZYMES, NUCLEIC ACIDS) AND THEREBY DISRUPT THE METABOLISM OF MICROORGANISMS



- Advantages of gas plasma sterilization
 - Its ability to provide safe, nontoxic, dry, low-temperature sterilization in about one hour
 - By-products of plasma sterilization are primarily water and oxygen
 - Because these by-products are harmless, there is no need for aeration or environmental hazard concerns



- Disadvantages of gas plasma sterilization
 - It may not penetrate well
 - It may corrode some materials
 - Can not be used on paper, cellulose or linen

MONITORING THE EFFECTIVENESS OF STERILIZATION

- To ensure that sterilization has been successful the process of sterilization (and not the end product) is tested.
- Mechanical indicators
 - Are part of the autoclave or dry-heat oven itself, record time, temperature, and/or pressure readings during the sterilization cycle.
- Chemical indicators
 - Tape with lines that change color when the intended temperature has been reached.
 - Are used internally, placed where steam or temperature take longest to reach, or put on the outside of the wrapped packs to distinguish processed from non processed packages.
 - E.g. Bowie Dick Test









MONITORS AND INDICATORS

- BIOLOGICAL INDICATORS (BI)
 - A BIOLOGICAL INDICATOR IS A TEST SYSTEM CONTAINING VIABLE MICROORGANISMS (E.G., SPORE-LADEN STRIPS OR VIALS) PROVIDING A DEFINED RESISTANCE TO A SPECIFIED STERILIZATION PROCESS
 - BACILLUS STEAROTHERMOPHILUS :SPORES FOR STERILIZERS THAT USE STEAM, HYDROGEN PEROXIDE GAS PLASMA OR PERACETIC ACID, AS WELL AS IMMEDIATE USE STEAM STERILIZERS
 - BACILLUS ATROPHAEUS (FORMERLY BACILLUS SUBTILIS) SPORES FOR STERILIZERS THAT USE DRY HEAT OR ETHYLENE OXIDE.





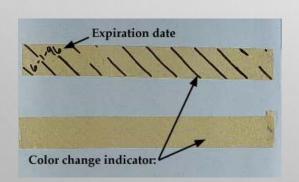
STORAGE

- Adequate storage space is provided to prevent crushing or damage to packages
- Environmental controls:
 - temperature maintained between 18 and 23C
 - relative humidity maintained between 30% and 60%
- Equipment/devices are stored in a clean, dry, dust-free area (closed shelves); not at floor level, on window sills, or under sinks; and are protected from debris, drains, moisture and vermin to prevent contamination



STERILITY CHECK LIST

- BEFORE ASSUMING A PACK IS STERILE, ALWAYS EVALUATE THE FOLLOWING BEFORE OPENING THE PACK:
 - EXPIRATION OR STERILIZATION DATE
 - INDICATOR COLOR CHANGE
 - GENERAL CONDITION OF WRAPPER AND HOW IT HAD BEEN STORED
 - ALWAYS CHECK FOR HOLES OR MOISTURE DAMAGE







ANTISEPTIC

- An antiseptic is a substance which inhibits the growth and development of microorganisms. applied to living tissue and skin
- It may be either bacteriocidal or bacteriostatic
- Their uses include cleansing of skin and wound surfaces after injury, preparation of skin surfaces prior to injections or surgical procedures
- Some commonly used antiseptics are for skin cleansing includes chlorhexidine, iodine compounds, and alcohol



COMMON ANTISEPTICS

- ALCOHOL
 - ALTHOUGH SEVERAL ALCOHOLS HAVE BEEN SHOWN TO BE EFFECTIVE ANTIMICROBIALS,
 - ETHYL ALCOHOL (ETHANOL, ALCOHOL),
 - ISOPROPYL ALCOHOL (ISOPROPANOL
 - PROPAN-2-OL) AND N-PROPANOL
 - ALCOHOLS EXHIBIT RAPID BROAD-SPECTRUM ANTIMICROBIAL ACTIVITY AGAINST VEGETATIVE BACTERIA (INCLUDING MYCOBACTERIA), VIRUSES, AND FUNGI BUT ARE NOT SPORICIDAL. THEY ARE

1. Alcohol (60-90% ethyl or isopropyl)

Antimicrobial	Effective against a broad range of microorganisms e.g. bacteria,	
Spectrum	and mycobacteria,	
Advantages	Rapidly active	
	 Effective in reducing vegetative microorganisms 	
	 Effectiveness is only moderately reduced by blood or other 	
	organic material	
	Non-staining	
	Less expensive	
Disadvantages	Has a drying effect on skin	
	 Cannot be used on mucous membranes 	
	 Evaporates rapidly and makes contact time difficult to achieve 	
	 No prolonged activity however the reduction in skin flora is so 	
	pronounced that regrowth on the skin does not occur for several hours	
Comments	 Cannot be used when skin is dirty; area should be washed before 	
	applying	
	 Must dry completely to be effective 	
	 The 60-90% strength is most effective 	
	 Very effective surgical hand antiseptic when used in waterless alcohol handrub formula 	



COMMON ANTISEPTICS

- CHLORHEXIDINE
 - CHLORHEXIDINE IS PROBABLY THE MOST WIDELY USED BIOCIDE AND ANTISEPTIC.
 - BROAD-SPECTRUM EFFICACY,
 - SUBSTANTIVELY FOR THE SKIN, AND LOW IRRITATION.

2. Chlorhexidine gluconate (4%)

Antimicrobial spectrum	Effective against a broad range of microorganisms, but less so against gram-negative bacteria and fungi and minimal efficacy against <i>M. tuberculosis</i> .	
Advantages	 Has a good, persistent effect; remains effective for at least 6 hours after being applied. 	
	 Effectiveness is not reduced by blood or other organic material. 	
Disadvantages	 It stains fabrics brown (in the presence of chlorine-based disinfectants). 	
	 Effectiveness can be reduced by hard water, hand creams, and soaps. 	
Comments	 Recommended antiseptic for surgical hand antisepsis and skin preparation. 	
	 Preparations without cetrimide are preferable to those with cetrimide. 	
	 Caution: Savlon™ or Citiel products containing at least 4 % chlorhexidine are appropriate for use as antiseptics; Products containing less than 4 % chlorhexidine in an alcohol base are also adequate, but should not be used on mucous membranes. Chlorhexidine is relatively non-toxic. It must not be allowed to come into contact with the brain, meninges, eye or middle ear. 	



COMMON ANTISEPTICS

- IODINE AND IODOPHORS.
 - IODINE IS RAPIDLY BACTERICIDAL, FUNGICIDAL, TUBERCULOCIDAL, VIRUCIDAL, AND SPORICIDAL.
 - ALTHOUGH AQUEOUS OR ALCOHOLIC (TINCTURE) SOLUTIONS OF IODINE
 - THEY ARE ASSOCIATED WITH IRRITATION
 - EXCESSIVE STAINING
 - ARE GENERALLY UNSTABLE
 - THE MOST WIDELY USED ARE POVIDONE-IODINE AND POLOXAMER-IODINE IN ANTISEPTICS.

3. lodine compounds, including tincture of iodine (iodine and alcohol)

Antimicrobial spectrum	Effective against a broad range of microorganisms (same as alcohol)
Advantages	Fast-acting (tincture preparations only)
Disadvantages	Can cause skin irritation. Effectiveness is markedly reduced by blood or other organic material.
	Less persistent activity.
Comments	 Can cause contact dermatitis therefore has limited usefulness as an OT hand antiseptic.
	 Because of the potential to cause skin irritation, when iodine is used for preprocedure skin preparation, it must be allowed to dry; then is removed from the skin with alcohol.



4. lodophors

(Solutions such as povidone iodine (e.g., Betadine) that contains iodine in a complex form, making them relatively nonirritating and nontoxic)^{25, 26}

Antimicrobial spectrum	Effective against a broad range of microorganisms (mainly gram +ve and gram –ve bacteria. Less effective against mycobacteria).	
Advantages	Less irritating to the skin than iodine tincture.	
	Can be used on mucous membranes.	
Disadvantages	 Effectiveness is moderately reduced by blood or other organic material. 	
	 Release of active ingredient, free iodine, takes relatively long time therefore it needs to be applied to skin and left on for > 2 minutes prior to initiating procedure. 	
	 Less persistent antimicrobial activity compared to chlorhexidine. 	
Comments	 Recommended for surgical hand antisepsis and pre-operative skin preparation. 	
	Best antiseptic for use in the genital area, vagina, and cervix.	
	Becomes effective >2 minutes after application; for optimal effectiveness, wait several minutes after application.	
	Most preparations should be used full strength; do not dilute.	
	 Distinctly different from iodine but can be confused for iodine tincture. 	
	Note: If any antiseptic solution is received from the facility's pharmacy or central supply that is labeled simply "iodine" the pharmacist or person in charge of supplies should be asked what the solution contains. For example, if a brown liquid in a bottle is received, a small amount has to be put in hand and be rubbed. If it seems more sudsy than usual, it is an iodophor, not iodine.	



THANK YOU